

CLAIMS:

1. A method for the generation of at least one image on a selectable part of the retina of a viewer's eye, to form an ocular image thereon, comprising:
 - 5 (a) receiving an image being composed of a number of image elements that correspond to the number of cone photoreceptors of a viewer's fovea, so as to constitute a received image;
 - (b) displaying said received image or derivative thereof, so as to constitute a displayed image;
- 10 (c) projecting said displayed image or derivative thereof onto a viewer's fovea area, so as to constitute a foveal image, such that a number of image elements of said foveal image corresponds to the number of cone photoreceptors of the viewer's fovea; and
- 15 (d) projecting said displayed image or derivative thereof onto a viewer's retina so as to constitute a retinal image.
2. The method according to said Claim 1, wherein said foveal and retinal images both include the same number of image elements.
3. The method according to said Claim 1, wherein said foveal image includes larger number of image elements than the number of image elements included in said retinal image.
- 20 4. The method according to Claim 1, wherein said foveal image being the image received in (a).
5. The method according to Claim 1, wherein said retinal image being the image received in (a).
- 25 6. The method according to Claim 1, wherein said number of image elements of said received image being substantially one fourth of said number of cone photoreceptors of the viewer's fovea.
7. The method according to Claim 1, wherein said number of image elements of said foveal image being substantially one fourth of said number of cone

photoreceptors of the viewer's fovea.

8. The method according to Claim 1, wherein said number of image elements of said received image being the same as the number of cone photoreceptors of the viewer's fovea.
- 5 9. The method according to Claim 1, wherein said number of image elements of said foveal image being the same as the number of cone photoreceptors of the viewer's fovea.
10. The method according to Claim 1, wherein said image element being a pixel.
- 10 11. The method according to Claim 1, wherein said foveal image and said retinal image being projected to the same viewer's eye.
12. The method according to Claim 11, wherein said foveal image and said retinal image being projected simultaneously.
- 15 13. The method according to Claim 11, wherein said foveal image being projected before said retinal image.
14. The method according to Claim 11, wherein said foveal image being projected after said retinal image.
15. The method according to Claim 1, wherein said foveal image and said retinal image being projected to different viewer's eyes, respectively.
- 20 16. The method according to Claim 15, wherein said foveal image and said retinal image being projected simultaneously.
17. The method according to Claim 15, wherein said foveal image being projected before said retinal image.
- 25 18. The method according to Claim 15, wherein said foveal image being projected after said retinal image.
19. The method according to Claim 1, wherein said foveal image and said retinal image being projected also to the other viewer's eye.
20. The method according to Claim 1, wherein the image received in (a) is a view of an object from a given direction, and further comprising:
 - 30 (e) computing an image to be a view of the same object as from

a different direction and applying said (b) to (d) in respect of the computed image, so as to constitute a stereoscopic perception of said object by the other eye of the viewer.

21. The method according to Claim 1, wherein the image received in (a) is a view of an object from a given direction, and further comprising:
5 repeating said (a) to (d) in respect of a received image of the same object from a different direction, so as to constitute a stereoscopic perception of said object by the other eye of the viewer.
22. The method according to Claim 1, wherein said (a) to (d) are repeated in respect of each image in a succession of images.
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23. A method according to claim 22 wherein said succession of received images being video images.
24. The method according to Claim 22, wherein said images are received at a rate of at least 20 Hz.
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25. The method according to Claim 22, further comprising:
 - (f) regenerating at least one image so as to constitute, together with at least one received image, a succession of images; and
 - (g) repeating said (b) to (d) in respect to each image of said succession of images.
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26. The method according to Claim 22, wherein at least two consecutive images from said succession of received images are views of the same object taken from different directions, so as to constitute a stereoscopic perception of said object by the viewer.
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27. A method for the generation of at least one image on a selectable part of the retina of a viewer's eye, to form an ocular image thereon, comprising:
 - (a) scaling down a source image into an image being composed of a number of image elements that correspond to the number of cone photoreceptors of a viewer's fovea and transmitting the image;
 - (b) receiving the image;
 - 30 (c) displaying said received image or derivative thereof, so as to constitute a

displayed image;

(d) projecting said displayed image or derivative thereof onto a viewer's fovea so as to constitute a foveal image, such that a number of image elements of said foveal image corresponds to the number of cone photoreceptors of the viewer's fovea; and

(e) projecting said displayed image or derivative thereof onto a viewer's retina so as to constitute a retinal image.

28. A method according to claim 27 wherein said (a) further includes transmission of data other than said image.

10 29. A method for transmission of high fidelity images over a low bandwidth communication channel, comprising performing the following in respect of each one of said images:

(a) scaling down the image into an image being composed of a number of image elements that correspond to the number of cone photoreceptors of a viewer's fovea and transmitting the image over the narrow band communication channel;

15 (b) receiving the image;

(c) generating the image or derivative thereof onto a viewer's fovea area so as to constitute a foveal image, such that a number of image elements of said foveal image corresponds to the number of cone photoreceptors of the viewer's fovea; and

20 (d) generating said displayed image or derivative thereof onto a viewer's retina so as to constitute a retinal image.

30. A method according to claim 29 wherein said (a) further includes transmission of data other than said image.

25 31. The method according to Claim 29, wherein said low bandwidth communication channel being a telephone line

32. The method according to Claim 29, wherein said communication channel has a transmission capacity of at least 20Kbit per second.

30 33. The method according to Claim 32, wherein said communication channel

being a telephone line and has a transmission capacity of 56Kbit per second.

34. The method according to Claim 32, wherein said communication channel being a cellular communication line and has a transmission capacity of 20Kbit per second.

5 35. A method for the generation of an image to form an ocular image on the fovea of an viewer's eye, the method comprising:

10 (a) displaying an image composed of a number of image elements that correspond to the number of cone photoreceptors of the viewer's fovea; and

(b) projecting said image onto the viewer's fovea.

15 36. A method for the generation of at least one image on a selectable part of the retina of a viewer's eye, to form an ocular image thereon, comprising:

scaling down a source image into an image being composed of a number of image elements that correspond to the number of cone photoreceptors of a viewer's fovea and transmitting the image.

20 37. A method according to claim 36 further comprising transmitting data other than said image.

38. A system for the generation of at least one image on a selectable part of the retina of a viewer's eye, to form an ocular image thereon, comprising:

25 receiver, receiving an image being composed of a number of image elements that correspond to the number of cone photoreceptors of a viewer's fovea, so as to constitute a received image;

display, displaying said received image or derivative thereof, so as to constitute a displayed image;

20 an assembly for projecting said displayed image or derivative thereof onto a viewer's fovea area, so as to constitute a foveal image, such that a number of image elements of said foveal image corresponds to the number of cone photoreceptors of the viewer's fovea;

30 the assembly further projecting said displayed image or derivative thereof onto a viewer's retina so as to constitute a retinal image.

39. A system for the generation of at least one image on a selectable part of the retina of a viewer's eye, to form an ocular image thereon, comprising:

- a device for scaling down a source image into an image being composed of a number of image elements that correspond to the number of cone photoreceptors of a viewer's fovea and transmitting the image.

40. An apparatus for the forming of an image on a selectable part of the retina of a viewer's eye to form an ocular image thereon, comprising:

- a surface positioned approximately normal to an optical path, said optical path including a section incident to a selectable point of the retina,
- means for generating a displayed image on said surface;
- an optical element positioned along said optical path for directing light rays emanating from said displayed image to the viewers' eye; to form said ocular image.
- a corporally mountable housing for the mounting of said surface and said optical element on said viewer.
- wherein said image is changeably formed:
- substantially on the fovea, and
- on any part of the retina.

41. The apparatus according to claim 40, wherein said surface for generating said displayed image thereon:

- is part of a body comprising a plurality of image elements,
- is in optical communication with said image elements.

42. The apparatus according to claim 41, wherein said surface for generating said displayed image is in functional communication with a source of video images to generate said displayed image thereon.

43. The apparatus according to claim 42, wherein said source of succession of images transmits data to generate at least 10 displayed images per second at a constant frequency.

44. The apparatus according to claim 40, wherein said surface for generating said displayed image thereon is made to receive an optical projection of an

image.

45. The apparatus according to claim 40, wherein said surface for generating said displayed image thereon is curved.

5 46. The apparatus according to claim 41, wherein the number of said plurality of image elements does not exceed the number of cones on said part of the retina.

47. The apparatus according to claim 41, wherein the number of said plurality of image elements does not exceed the number of optical fibers on said part of the retina.

10 48. The apparatus according to claim 40, wherein said housing is cranially mountable.

49. The apparatus according to claim 40, wherein:

 said surface,

 said optical element,

15 are provided for each eye,

 for establishing an optical communication between a displayed image formed on each one of said surfaces and each retina.

50. The apparatus according to claim 49, wherein:

 two of said surfaces are provided,

20 a different displayed image is generated on each one of said surfaces, to stimulate a stereoscopic perception by said viewer.

51. The apparatus according to claim 40 including a light source, wherein said surface is disposed on said optical path between said light source and said eye's retina to transmit light from said light source towards said selectable part of the retina.

25 52. The apparatus according to claim 51, wherein light reaches the retina intermittently.

53. The apparatus according to claim 52, wherein said light source emits light at a constant frequency of at least 13 Hz.

30 54. The apparatus according to claim 40, wherein each one of said two

displayed images is generated at a constant frequency of at least 13 Hz.

55. The apparatus according to claim 54, wherein said light path is obstructed intermittently.

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